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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,658	07/31/2003	Thomas A. Taylor	21320	9490

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EXAMINER	
BAREFORD, KATHERINE A	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/630,658	TAYLOR, THOMAS A.	
	Examiner	**Art Unit**	
	Katherine A. Bareford	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 22 January 2008.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) 14-20 is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-13 and 21-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on January 22, 2008 has been entered.

The amendment filed with the RCE submission of January 22, 2008 has been received and entered. With the entry of the amendment, claims 14-20 remain withdrawn from consideration, and claims 1-13 and 21-24 (including new claims 23-24) are pending for examination.

2. The Examiner notes that in the Board of Appeals decision of November 30, 2007, the rejection of all the then pending claims (1-13 and 21-22) was affirmed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-13 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zurecki et al (US 5738281) in view of Nowotarski et al (US 5486383) and the admitted state of the prior art.

Claims 1, 23, 24: Zurecki teaches a method of placing a gas shroud around a turbulent gas jet. *Column 1, lines 5-15.* This method can be used in spraying applications, such as thermal spray coating. *Column 4, lines 15-25.* An effluent jet exits from an orifice of the thermal spray device and is surrounded with a coaxial gas shield having a shield gas flow substantially surrounding the effluent of the thermal spray device. *Column 3, lines 1-25.* By using an inert surrounding gas, when thermal spraying, the amount of oxygen aspirated into the jet is reduced, thus minimizing the oxidation of the sprayed coating material and providing a desired microstructure of a coating with minimized oxidation of the coating material as supplied. *Column 4, lines 15-25.* As shown by Example 3, oxygen concentration in the spray jets of shrouded spray devices of Zurecki can be well over 50% less that for unshrouded jets at the same standoff distance (3 inches). *Column 9, lines 45-55 and column 11, lines 10-60, note, for example, in run no. 2, for example, with no shroud gas flow, the first or "0" flow rate, oxygen conc. is 14.0, going down to 2.1 as the flow rate of the shroud gas is increased (Table 2).*

Claims 3, 24: As shown by Example 3, oxygen concentration in the spray jets of shrouded spray devices of Zurecki can be well over 50% less that for unshrouded jets at the same standoff distance (3 inches). *Column 9, lines 45-55 and column 11, lines 10-60, note, for example, in run no. 2, for example, with no shroud gas flow, the first or "0" flow rate, oxygen conc. is 14.0, going down to 2.1 as the flow rate of the shroud gas is increased (Table 2).*

Claim 4, 5: the gas flow can be essentially turbulent. *Column 3, lines 5-30 (the spray effluent from the spray device is turbulent, and the shroud gas is entrained in that flow).*

Claim 9: the shield (shroud) gas can be nitrogen. *See column 11, lines 10-60.*

Zurecki teaches all the features of these claims except (1) that the resulting effect of the shield gas on microstructure will allow an extended standoff distance for the same microstructure, as compared to without using a shield gas, (2) that the material to be sprayed is a ceramic oxide (claim 2, 6, 11, 21), which would be not sensitive to oxidation or nitridation (claim 1), (3) that the shield gas is argon (claim 10), (4) that the ceramic oxide is zirconia (claims 7, 12), (5) that the multiple layers of coating material are provided (claims 8, 13), (6) that the substrate has a complex shape such as turbine blades or vanes (claims 1, 22) and (7) the specific gas temperature effects of using the shield gas (claim 1, 23, 24).

However, Nowotarski teaches that when thermal spraying, a turbulent fluid stream is ejected from a spray nozzle. *Column 3, lines 20-60.* The stream can carry coating material which can be metals, alloys, oxides, ceramics, and other materials. *Column 3, lines 20-65.* Nowotarski teaches the desire to surround the stream with a

shielding gas flow of an inert gas such as nitrogen, argon, etc. *See column 3, line 60 through column 4, line 40.* The use of this shielding gas prevents oxygen from entering the spray stream so that oxidation or contamination or degradation of materials is minimized. *Column 4, lines 20-35.* The amount of shielding fluid used is such that the oxygen level at the point of impact can be less than 1%. *Column 4, lines 25-35.* Nowotarski teaches that by reducing the oxygen level, the standoff distance can be increased. *Column 7, lines 35-55.* Nowotarski provides that the standoff distance can be increased by the use of a shielding gas whether the gas is heated or unheated, as in example 1, column 6, lines 40-60, which indicates that a six inch standoff can be used compared to 4 inches in the prior art with an oxygen level of 0.01%, and note example 2, at column 7, lines 20-35, indicates that the example 1 conditions did not have a heated gas (since it requires a change in conditions to provide heated gas), and note example 2, at column 7, lines 40-55, which indicates that still further increases in standoff can be provided with heated gas.

The admitted state of the prior art, *at pages 4-5 of the specification*, teaches that it is well known to apply ceramic coatings by thermal spraying. These ceramic coatings can include thermal barrier coatings. The thermal barrier coatings are often multilayer coatings with a metallic bond coat followed by a ceramic top coat. The ceramic top coat is usually based on zirconium oxide (zirconia -- zirconia would be non-sensitive material as claimed—see claim 12 of the present application). The metallic bond coat can also be applied by thermal spraying. The admitted state of the art further teaches

that it is well known to apply these thermal spray coatings to complex shapes such as turbine vanes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to (1) modify Zurecki to use the shield gas system to increase the standoff distance but still achieve the same microstructure resulting from spraying without the shield gas at a shorter standoff distance as suggested by Nowotarski in order to provide a desirable coating, because Zurecki teaches that the use of the coaxial shielding gas provides a decreased oxygen level in the spray stream for a given distance, thus reducing oxidation of the applied coating (that is, providing a desired microstructure of limited further oxidation effects) and Nowotarski teaches that the use of shielding gas that provides a decreased oxygen level in the spray stream for a given distance can allow an increased standoff distance, and that the shielding gas can be used to reduce oxidation, contamination or degradation of the material (again providing a desired microstructure). This provides a longer standoff distance to get the same microstructure as without shielding, because the resulting microstructure provided by the presence of a first amount of oxygen will not occur until a longer standoff distance when shielding is used since that first amount of oxygen will be present in the stream a much greater distance (more than 50 % as shown by Zurecki) from the nozzle. The standoff distance would be increased more than 50% since the contents of the stream that produces the effective microstructure occurs at a more than 50% greater distance. (2) It would further have been obvious to modify Zurecki to

perform the spraying with ceramic oxides, which would be materials not sensitive to oxidation or nitridation (as they have already been oxidized), as taught by Nowotarski with an expectation of desirable coating results, because Zurecki teaches a desirable shield gas spraying system and Nowotarski teaches the desire to shield coatings of ceramics and oxides as well as metals, as the shield also prevents contamination as well as oxidation. (3) It would further have been obvious to modify Zurecki to perform the shielding with argon as taught by Nowotarski with an expectation of desirable coating results, because Zurecki teaches the desire to shield with an inert gas, such as nitrogen, and Nowotarski also teaches the desire to shield coating sprays with inert gases, and that inert gas for shielding can beneficially include argon as well as nitrogen. (4), (5), (6) It would further have been obvious to modify Zurecki in view of Nowotarski to apply a zirconia coating (zirconia would be non-sensitive material as claimed—see claim 12 of the present application), to apply a multilayer coating such as a thermal barrier coating of metallic bond coat followed by ceramic top coat, and to apply the coating to a complex shape such as a turbine vane/blade using the shielded gas system as suggested by the admitted state of the prior art with an expectation of providing a desirable coating, because Zurecki in view of Nowotarski teaches a gas shielding system for thermal spraying that can be beneficially used with metals or ceramic oxides and the admitted state of the prior art teaches that when thermal spraying a desirable coating system to apply is metal bond coats followed by zirconia (zirconium oxide) top coats to a complex shaped substrate such as a turbine vane/blade. (7) As to the specific

gas temperature effects of using the shield gas (as claimed in the last six lines of claim 1), it is the Examiner's position that such temperature effects would naturally occur with the use of the process of Zurecki in view of Nowotarski and the admitted state of the prior art as described above, because it is the suggested use of the shield gas that provides these gas temperature effects, and the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). For example, the Examiner notes that Zurecki provides increasing flow rates of shield gas in its own tests (see Table 2, column 11, line 35).

5. Claims 1-13 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zurecki et al (US 5738281) in view of Nowotarski et al (US 5486383) and Taylor, et al "Experience with M Cr Al and thermal barrier coatings produced via inert gas shrouded plasma deposition" (hereinafter Taylor article).

Claims 1, 23, 24: Zurecki teaches a method of placing a gas shroud around a turbulent gas jet. *Column 1, lines 5-15.* This method can be used in spraying applications, such as thermal spray coating. *Column 4, lines 15-25.* An effluent jet exits from an orifice of the thermal spray device and is surrounded with a coaxial gas shield having a shield gas flow substantially surrounding the effluent of the thermal spray

device. *Column 3, lines 1-25.* By using an inert surrounding gas, when thermal spraying, the amount of oxygen aspirated into the jet is reduced, thus minimizing the oxidation of the sprayed coating material and providing a desired microstructure of a coating with minimized oxidation of the coating material as supplied. *Column 4, lines 15-25.* As shown by Example 3, oxygen concentration in the spray jets of shrouded spray devices of Zurecki can be well over 50% less that for unshrouded jets at the same standoff distance (3 inches). *Column 9, lines 45-55 and column 11, lines 10-60, note, for example, in run no. 2, for example, with no shroud gas flow, the first or "0" flow rate, oxygen conc. is 14.0, going down to 2.1 as the flow rate of the shroud gas is increased (Table 2).*

Claim 3, 24: As shown by Example 3, oxygen concentration in the spray jets of shrouded spray devices of Zurecki can be well over 50% less that for unshrouded jets at the same standoff distance (3 inches). *Column 9, lines 45-55 and column 11, lines 10-60, note, for example, in run no. 2, for example, with no shroud gas flow, the first or "0" flow rate, oxygen conc. is 14.0, going down to 2.1 as the flow rate of the shroud gas is increased (Table 2).*

Claim 4, 5: the gas flow can be essentially turbulent. *Column 3, lines 5-30 (the spray effluent from the spray device is turbulent, and the shroud gas is entrained in that flow).*

Claim 9: the shield (shroud) gas can be nitrogen. *See column 11, lines 10-60.*

Zurecki teaches all the features of these claims except (1) that the resulting effect of the shield gas on microstructure will allow an extended standoff distance for the same microstructure as compared to without using shield gas, (2) that the material to be sprayed is a ceramic oxide (claim 2, 6, 11, 21), which would be not sensitive to oxidation

or nitridation (claim 1), (3) that the shield gas is argon (claim 10), (4) that the ceramic oxide is zirconia (claims 7, 12), (5) that the multiple layers of coating material are provided (claims 8, 13), (6) that the substrate has a complex shape such as turbine blades or vanes (claims 1, 22) and (7) the gas temperature effects of using the shield gas (claim 1, 23, 24).

However, Nowotarski teaches that when thermal spraying, a turbulent fluid stream is ejected from a spray nozzle. *Column 3, lines 20-60.* The stream can carry coating material which can be metals, alloys, oxides, ceramics, and other materials. *Column 3, lines 20-65.* Nowotarski teaches the desire to surround the stream with a shielding gas flow of an inert gas such as nitrogen, argon, etc. *See column 3, line 60 through column 4, line 40.* The use of this shielding gas prevents oxygen from entering the spray stream so that oxidation or contamination or degradation of materials is minimized. *Column 4, lines 20-35.* The amount of shielding fluid used is such that the oxygen level at the point of impact can be less than 1%. *Column 4, lines 25-35.* Nowotarski teaches that by reducing the oxygen level, the standoff distance can be increased. *Column 7, lines 35-55.* Nowotarski provides that the standoff distance can be increased by the use of a shielding gas whether the gas is heated or unheated, as in example 1, column 6, lines 40-60, which indicates that a six inch standoff can be used compared to 4 inches in the prior art with an oxygen level of 0.01%, and note example 2, at column 7, lines 20-35, indicates that the example 1 conditions did not have a heated gas (since it requires a change in conditions to provide heated gas), and note example 2,

at column 7, lines 40-55, which indicates that still further increases in standoff can be provided with heated gas.

Taylor article teaches that it is well known to apply ceramic coatings by plasma spraying, a form of thermal spraying. *Page 2526-2527.* These ceramic coatings can include thermal barrier coatings. *Page 2526-2527.* The thermal barrier coatings can be multilayer coatings with a metallic bond coat followed by a ceramic top coat. *Page 2527.* The ceramic top coat is can be based on zirconium oxide (zirconia-- zirconia would be non-sensitive material as claimed—see claim 12 of the present application). *Page 2527.* The metallic bond coat can also be applied by plasma spraying. *Page 2527 (the M Cr Al coat).* Taylor article further teaches that it is well known to apply these thermal spray coatings to complex shapes such as turbine vanes. *See page 2530, first column.* Taylor article also teaches that it is beneficial to apply the M Cr Al coat by shrouded (shielded gas) plasma spraying. *Pages 2526-2527.* Furthermore, Taylor article teaches that the oxide ceramic thermal barrier overcoat can also desirably be applied by the same shrouded plasma spray (SPS) system, allowing the two layer system to be applied in the same setup using the same torch by simply switching from one powder dispenser to another. *Page 2527, first column.* The shrouding (shielding) gas can be argon. *Page 2526.*

It would have been obvious to one of ordinary skill in the art at the time the invention was made to (1) modify Zurecki to use the shield gas system to increase the standoff distance but still achieve the same microstructure resulting from spraying without the shield gas at a shorter standoff distance as suggested by Nowotarski and

Taylor article in order to provide a desirable coating, because Zurecki teaches that the use of the coaxial shielding gas provides a decreased oxygen level in the spray stream for a given distance, thus reducing oxidation of the applied coating (that is, providing a desired microstructure of limited further oxidation effects) and Nowotarski teaches that the use of shielding gas that provides a decreased oxygen level in the spray stream for a given distance can allow an increased standoff distance, and that the shielding gas can be used to reduce oxidation, contamination or degradation of the material (again providing a desired microstructure) and Taylor article further teaches that it is desirable to use a shrouding (shielding) gas when thermal spraying materials such as oxide thermal barrier coatings to provide more efficient spraying. This provides a longer standoff distance to get the same microstructure as without shielding, because the resulting microstructure provided by the presence of a first amount of oxygen will not occur until a longer standoff distance when shielding is used since that first amount of oxygen will be present in the stream a much greater distance (more than 50 % as shown by Zurecki) from the nozzle. The standoff distance would be increased more than 50% since the contents of the stream that produces the effective microstructure occurs at a more than 50% greater distance. (2), (4), (5), (6) It would further have been obvious to modify Zurecki to perform the spraying with ceramic oxides, such as zirconia (zirconia would be non-sensitive material as claimed—see claim 12 of the present application), which would be materials not sensitive to oxidation or nitridation (as they have already been oxidized), and to apply a multilayer coating such as a thermal barrier coating of

metallic bond coat followed by ceramic top coat, and to apply the coating to a complex shape such as a turbine vane/blade using the shielded gas system as suggested by Nowotarski and Taylor article with an expectation of desirable coating results, because Zurecki teaches a desirable shielded gas spraying system, and Nowotarski teaches the desire to shield coatings of ceramics and oxides as well as metals, as the shield also prevents contamination as well as oxidation, and Taylor article further teaches that when thermal spraying a desirable coating system to apply is metal bond coats followed by zirconia top coats to a complex shaped substrate such as a turbine vane/blade using a shrouded (shield gas) plasma spraying system. (3) It would further have been obvious to modify Zurecki to perform the shielding with argon as taught by Nowotarski and Taylor article with an expectation of desirable coating results, because Zurecki teaches the desire to shield with an inert gas, such as nitrogen, and Nowotarski also teaches the desire to shield coating sprays with inert gases, and that inert gas for shielding can beneficially include argon as well as nitrogen and Taylor article further teaches the use of argon as a shielding gas when plasma spraying oxides. (7) As to the specific gas temperature effects of using the shield gas (as claimed in the last six lines of claim 1), it is the Examiner's position that such temperature effects would naturally occur with the use of the process of Zurecki in view of Nowotarski and Taylor article as described above, because it is the suggested use of the shield gas that provides these gas temperature effects, and the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis

for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). For example, the Examiner notes that Zurecki provides increasing flow rates of shield gas in its own tests (see Table 2, column 11, line 35).

Response to Arguments

6. Applicant's arguments filed January 22, 2008 have been fully considered but they are not persuasive.

Applicant argues, as to both 35 USC 103 rejections, that in the Board of Appeals decision (November 30, 2007), the Board noted that the use of the term "comprising" in claim 1 opens the claim "to include any manner of other steps and additional materials, such as heating the shielding gas to increase exit standoff." Applicant further cites the Board as providing:

> "Nowotarski further teaches that the particular shielded plasma thermal spray devices taught therein provide better standoff and thermal properties of the shielded effluent compared to other shielded plasma thermal spray devices. This reference recognizes the temperature effect of heated shielding gas on standoff and the effect of increased flow of the shielding gas on standoff. Thus, we are of the view that one of ordinary skill in this art would have recognized that Nowotarski's shielded plasma thermal spraying devices can be used to apply ceramic coatings to complex surfaces with a larger standoff parameter than would be achieved with other shielded thermal spray devices, and thus of non-shielded thermal spray devices, and that the standoff parameter can be further improved by increasing the temperature and amount of shielding gas."

Applicant argues that amended claim 1 no longer contains the "comprising" language and is thus not open to include other steps such as heating the shielding gas to increase exit standoff, and, likewise, newly added claims 23 and 24 do not contain "comprising" language and are not open to include other steps such as heating the shielding gas to increase exit standoff.

The Examiner has reviewed these arguments, however, the rejections are maintained. The Examiner notes that, firstly, the primary reference to Zurecki teaches the use of the shielding gas (as discussed in the rejection above) and provides no indication that this gas needs to be heated, and the Examples indicate the use of shield (shrouding) gas at 298 K (which would be an ambient temperature of about 24.8 degrees C) (see column 11, lines 15-20, for example). Furthermore, as to the use of the secondary reference to Nowotarski, as discussed in the rejection above, Nowotarski provides that the standoff distance can be increased by the use of a shielding gas whether the gas is heated or unheated, as in example 1, column 6, lines 40-60, which indicates that a six inch standoff can be used compared to 4 inches in the prior art with an oxygen level of 0.01%, and note example 2, at column 7, lines 20-35, indicates that the example 1 conditions did not have a heated gas (since it requires a change in conditions to provide heated gas), and note example 2, at column 7, lines 40-55, which indicates that still further increases in standoff can be provided with heated gas. In other words, the use of ambient temperature gas (70 degrees F), still provides a reduced oxygen level, and therefore allows for an increase in standoff rate. The reduction in oxygen level

when using shield/shroud gas compared to unshielded/unshrouded system is also shown in Zurecki when using ambient temperature shield gas (see column 11, lines 25-40, run 2, and column 12, lines 60-65, see runs 2 and 3, for example). While Nowotarski may indicate that the best improvement is with heated gas (as noted in the paragraph of the Board decision cited by appellant), the reference does still indicate improvement with ambient temperature gas, and as discussed in MPEP 2123, "Disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments. In re Susi, 440 F.2d 442, 169 USPQ 423 (CCPA 1971)." Therefore, (1) even if applicant is correct and the use of the terms "consisting essentially of" and "consisting" in claims 1 and 23-24 do not allow the use of heated shield gas, the combination of references makes it perfectly plain that the present invention would be obvious with the use of ambient temperature shield gas. (2) The Examiner is further of the position that the claims as worded also do not exclude the use of "heated" shield gas, because even when using "consisting essentially of" and "consisting", the present claims require the presence of a "shield gas" and, as worded, the present claims simply provide that a "shield gas" must be present, and no qualifications are made as to the temperature of the shield gas to be provided, and therefore all possible temperature conditions of the shield gas are included in the claims, including heated, cold or ambient temperatures.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792